National Institute of Environmental Health Sciences

# Health research based on geospatial tools: A timely approach in a changing environment

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**Abstract:**

The possibilities of disease prediction based on the environmental characteristics of geographical areas and specific requirements of the causative infectious agents are reviewed and, in the case of parasites whose life cycles involve more than one host, the needs of the intermediate hosts are also referred to. The geographical information systems framework includes epidemiological data, visualization (in the form of maps), modelling and exploratory analysis using spatial statistics. Examples include climate-based forecast systems, based on the concept of growing degree days, which now exist for several parasitic helminths such as fasciolosis, schistosomiasis, dirofilariasis and also for malaria. The paper discusses the limits of data collection by remote sensing in terms of resolution capabilities (spatial, temporal and spectral) of sensors on-board satellites. Although the data gained from the observation of oceans, land, elevations, land cover, land use, surface temperatures, rainfall, etc. are primarily for weather forecasting, military and commercial use, some of this information, particularly that from the climate research satellites, is of direct epidemiological utility. Disease surveillance systems and early-warning systems (EWS) are prime examples of academic approaches of practical importance. However, even commercial activities such as the construction of virtual globes, i.e. computer-based models of the Earth, have been used in this respect. Compared to conventional world maps, they do not only show geographical and man-made features, but can also be spatially annotated with data on disease distribution, demography, economy and other measures of particular interest.

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## Resource Description

**Communication:** ☑

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

**Communication Audience:** ☑

audience to whom the resource is directed

Researcher

**Early Warning System:** ☑

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

**Exposure :**

weather or climate related pathway by which climate change affects health

Temperature

**Geographic Feature:**

resource focuses on specific type of geography

None or Unspecified

**Geographic Location:**

resource focuses on specific location

Global or Unspecified

**Health Impact:**

specification of health effect or disease related to climate change exposure

Infectious Disease

**Infectious Disease:** Foodborne/Waterborne Disease, Vectorborne Disease

**Intervention:**

strategy to prepare for or reduce the impact of climate change on health

A focus of content

**Mitigation/Adaptation:**

mitigation or adaptation strategy is a focus of resource

Adaptation

**Resource Type:**

format or standard characteristic of resource

Research Article

**Timescale:**

time period studied

Time Scale Unspecified